A Study on Sustainable Development through Higher Education: The Role of Sino-Tanzanian Academic Partnerships in Achieving SDG 4

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ABSTRACT

This study examines how Sino-Tanzanian higher education partnerships are perceived in relation to Sustainable Development Goal 4 (SDG 4), focusing on access, educational quality, equity, and sustainability. It is presented in the source dataset as a qualitative case study supported by survey summaries, semi-structured interviews, open-ended responses, and documentary analysis. The dataset reports 250 survey participants, comprising 150 Tanzanian students studying in China, 35 Chinese volunteers in Tanzania, and 65 faculty members involved in research or exchange programmes; however, a separate analysis section lists 150 students, producing a total of 250. The interview results section reports 40 participants across administrators, policymakers, faculty members, and students.

Survey summaries indicate that 76% of Tanzanian students and 58% of Chinese volunteers perceived improvements in academic quality, while 81% of students and 62% of faculty reported career or professional benefits. The reported findings also identify language and cultural barriers, adaptation difficulties, curriculum differences, and administrative and funding delays. Because the source contains inconsistent sample counts and does not provide respondent-level data or complete statistical output, the results are interpreted as reported perceptions rather than independently verified effects. The study concludes that partnerships may support SDG 4 when accompanied by inclusive access, academic support, reciprocal collaboration, and sustainable institutional arrangements.

Keywords: Sino-Tanzanian partnerships; higher education; SDG 4; qualitative case study; academic cooperation; sustainable development

INTRODUCTION

Background and rationale

Education for Sustainable Development (ESD) positions education as both a human right and a means of building the knowledge, skills, values, and capacity needed to address interconnected social, economic, and environmental challenges. This role is reflected in Sustainable Development Goal 4 (SDG 4), which calls for inclusive and equitable quality education and lifelong learning opportunities for all (United Nations, 2015; UNESCO, 2017). ESD extends the discussion of educational quality beyond access and participation: it asks whether learning enables people to understand complex problems, consider different perspectives, and contribute to sustainable futures (Tilbury, 2011; UNESCO, 2020, 2021). These aims make higher education a significant setting for examining how educational systems can respond to development priorities.

Universities contribute to sustainable development through teaching, research, innovation, and engagement with communities and public institutions. They prepare graduates for professional and civic life, produce

knowledge relevant to social needs, and can support the development of institutional and community capacity. However, these contributions are not automatic. They depend on how sustainability is incorporated into curricula, research agendas, institutional practices, and relationships with external partners. Research on higher education and sustainability emphasizes the importance of integrating sustainability across institutional activity rather than treating it as a separate or symbolic commitment (Barth et al., 2014; Leal Filho et al., 2019; Owens, 2017). Higher education's contribution to SDG 4 therefore involves not only expanding opportunities, but also considering the relevance, quality, and distribution of those opportunities.

International academic partnerships are one means through which universities seek to expand educational access, exchange knowledge, develop research capacity, and strengthen institutional connections. Internationalization can bring global and intercultural dimensions into higher education's purposes and practices, including through student and staff mobility, collaborative research, and curriculum development (Knight, 2004; Altbach & de Wit, 2020). Yet the existence of a partnership does not establish that its benefits are equitable, locally relevant, or sustainable. Outcomes can depend on who participates, whose priorities guide collaboration, how learning is recognized, and whether partner institutions have the resources and decision-making authority to continue activities over time. This distinction between partnership activity and educational outcome is important when assessing claims about international cooperation and SDG 4.

China–Africa higher education cooperation has developed within broader South–South engagement and includes scholarships, academic exchanges, research collaboration, and other forms of institutional support (King, 2013, 2014; Li & Marsh, 2016). Tanzania provides a relevant national context for examining how such cooperation operates and what it may contribute. The manuscript identifies scholarships, faculty exchanges, joint research, and educational infrastructure as components of Sino-Tanzanian engagement. These forms of cooperation could support access to academic resources, professional development, and research networks. Their potential contribution to sustainable development, however, depends on how they respond to Tanzanian educational needs and whether the capabilities developed through partnership are retained and used within local institutions.

The partnership process may also involve challenges that shape the distribution and quality of educational benefits. Differences in language, teaching and learning practices, academic expectations, and institutional procedures can affect participants' ability to engage fully. Research on cross-cultural adaptation in higher education highlights the need to consider how students and staff navigate unfamiliar academic environments (Hou, Montgomery, & McDowell, 2022). Language barriers may influence classroom participation, comprehension, and access to academic support (Zhou & Pilcher, 2021). More broadly, if curricula, credit systems, or institutional priorities are poorly aligned, mobility and collaboration may not translate readily into recognized learning or durable capacity. Examining both enabling conditions and constraints is therefore necessary to assess how Sino-Tanzanian partnerships relate to inclusive and quality higher education.

Research problem and objectives

Although Sino-Tanzanian academic partnerships are associated with scholarships, exchanges, research collaboration, and institutional support, their specific contribution to SDG 4 in Tanzania remains insufficiently established in the material motivating this study. The presence of partnership programs or educational resources cannot, on its own, show whether opportunities are inclusive, whether learning quality improves, or whether institutional capacity becomes more sustainable. These questions require attention to the processes through which collaboration operates and to the experiences and outcomes of participating students, scholars, and institutions.

A further problem is the need to connect reported benefits with the conditions under which they occur. Partnerships may provide access to new academic resources and networks, while participants may also encounter language, cultural, pedagogical, or administrative barriers. If these constraints are not examined alongside potential benefits, assessments may overstate what partnership activity accomplishes or overlook unequal experiences. The study therefore treats the relationship between collaboration and SDG 4 as an

empirical question rather than assuming that international engagement necessarily advances inclusive, equitable, or quality education.

The study is guided by the following objectives:

- To examine the reported contributions of Sino-Tanzanian academic partnerships to higher education and SDG 4 in Tanzania.
- To assess how these partnerships support inclusive, equitable, and quality education, including the conditions that shape participants' educational experiences.
- To identify challenges and opportunities within the collaborations and develop recommendations for strengthening their effectiveness and sustainability.

Together, these objectives link partnership activities to educational processes, participant experiences, and institutional conditions. They also provide a basis for distinguishing direct evidence of educational outcomes from broader claims about sustainable development.

Significance of the study

This study is significant because it focuses on the relationship between international academic cooperation and the educational aims expressed in SDG 4. For policymakers, analysis of partnership contributions and constraints can inform decisions about how international programs align with national education priorities and institutional needs. This includes considering whether collaboration supports locally relevant capacity and whether barriers to participation or learning require policy attention. Evidence about program design and implementation can be more useful for decision-making than treating partnership presence as an indicator of success (Likoko & Wu, 2025).

For universities in Tanzania and China, the study can inform reflection on scholarships, exchanges, collaborative research, and other partnership arrangements. Examining how participants experience these initiatives may help institutions identify where academic support, communication, curriculum coordination, or recognition processes need attention. A focus on both contribution and constraint can also support more balanced partnership planning, with greater attention to reciprocal participation and the continuity of institutional benefits.

The study is also relevant to researchers and international education stakeholders concerned with South–South cooperation and sustainable development. By connecting partnership practices to inclusion, equity, educational quality, and institutional capacity, it contributes to discussion of how internationalization can serve development purposes while remaining responsive to local contexts (Knight, 2004; Li & Marsh, 2016). Its analysis may help clarify which claims about partnership impact require stronger evidence and which practical conditions warrant further investigation. The study's value ultimately depends on the quality of the evidence available and the care with which findings are interpreted; its purpose is to strengthen understanding of how Sino-Tanzanian academic partnerships may contribute to SDG 4, and what must be examined to assess that contribution responsibly.

LITERATURE REVIEW

Theoretical framework

This study draws on three complementary perspectives: internationalization of higher education, global citizenship education (GCE), and soft power. Together, they help explain how Sino-Tanzanian academic partnerships are organized, what educational purposes they may serve, and how cooperation can also reflect broader diplomatic relationships. Their combined use provides an analytical framework, but it does not presume that partnership activity necessarily improves educational outcomes.

Knight (2004) conceptualizes internationalization as integrating international, intercultural, and global dimensions into the purposes and delivery of higher education. This perspective directs attention to the

processes through which partnerships operate, including student and staff mobility, joint research, curriculum collaboration, and institutional links. These activities may create opportunities for knowledge exchange and institutional learning. However, internationalization is not itself evidence of improved quality or equity. Analysis must also consider whether learning is recognized, whether participants can engage effectively, and whether collaborative activity addresses institutional and national priorities.

GCE adds a learner-focused dimension. UNESCO (2015) presents global citizenship education as supporting the knowledge, values, and capacities needed to participate responsibly in an interconnected world. Academic exchange may expose students and staff to different intellectual and cultural perspectives, potentially strengthening intercultural understanding. Yet exposure alone does not establish that these capacities develop. The educational value of exchange depends on the conditions of interaction, including opportunities for meaningful participation and reflection. GCE therefore helps frame questions about the quality and inclusiveness of partnership experiences, rather than treating international contact as an outcome in itself. Soft power offers a political lens for interpreting education cooperation. Nye (2004) describes soft power as influence exercised through attraction and persuasion. Scholarships, cultural programs, and institutional partnerships can contribute to a country's international relationships while also serving educational purposes. Applying this perspective to Sino-Tanzanian cooperation raises questions about how partners' interests are represented, how priorities are negotiated, and whether educational benefits are reciprocal. It does not imply that diplomatic interests negate development value; rather, it encourages analysis of the relationship between educational aims and wider state engagement.

These perspectives address different parts of the study's problem. Internationalization focuses on institutional processes, GCE on educational and intercultural aims, and soft power on the diplomatic context. Their integration supports a conditional proposition: partnerships may contribute to educational development when international activity creates meaningful learning and institutional capacity, is accessible to participants, and responds to local priorities. The study uses this proposition to interpret both potential contributions and constraints.

Figure 1 connects the three theoretical lenses to partnership activity, learning and institutional processes, potential outcomes, and SDG 4. Cross-cutting conditions may enable or constrain the pathway; the arrows show conceptual relationships, not proven causal effects.

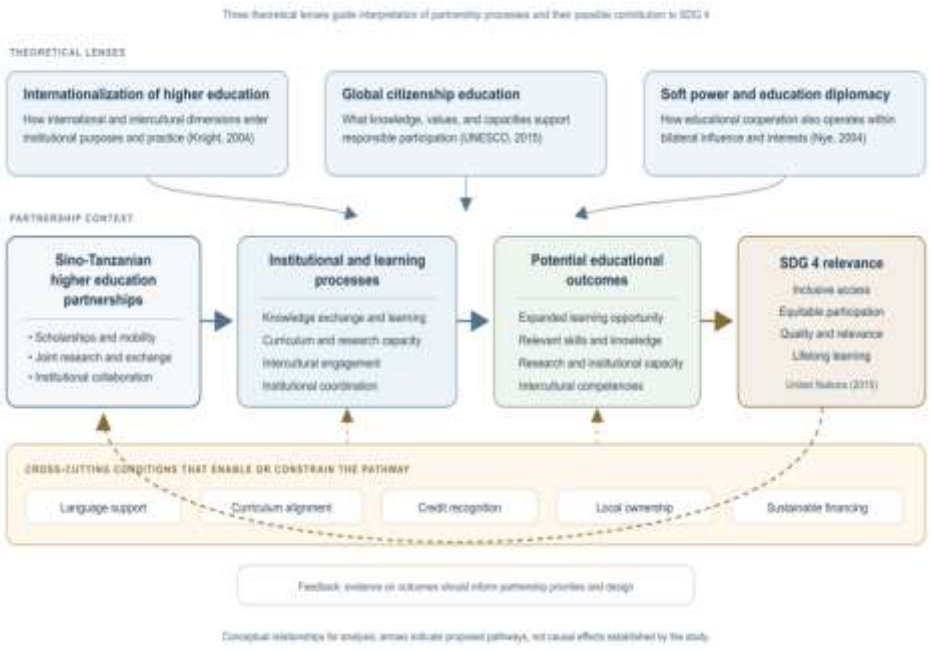


Figure 1: three theoretical lenses to partnership activity, learning and institutional processes, potential outcomes, and SDG 4

Sino-Tanzanian higher education cooperation

The source literature presents Sino-Tanzanian higher education cooperation as part of longer-standing bilateral engagement. It describes scholarships, academic exchanges, research collaboration, institutional links, and Chinese language and cultural programs as prominent forms of cooperation (Li & Otieno, 2020; Wang & Mkunde, 2021; Zhou & Mollel, 2019). These activities suggest several possible routes through which partnerships may affect higher education: scholarships may widen access to international study; exchanges may support academic and professional learning; research links may connect scholars and institutions; and language programs may facilitate intercultural contact.

However, the existence of these activities should be distinguished from evidence about their outcomes. The cited accounts identify potential benefits, but claims about improved capacity, skills, or development require evidence about who participates, what participants learn, whether learning is recognized, and how knowledge is used after an exchange. In particular, access to international study does not by itself demonstrate equitable access across student groups, while institutional links do not establish that research collaboration is sustained or aligned with local research priorities. This distinction is important for assessing partnership effectiveness without equating program inputs with educational impact.

The literature also identifies possible obstacles, including language differences, contrasting pedagogical expectations, and challenges in policy coordination (Likoko & Wu, 2025, Zhou & Mollel, 2019). These are not peripheral concerns: they can influence whether students participate fully, whether teaching and research collaboration are effective, and whether academic progress transfers across institutions.

Theoretical perspectives on internationalization and GCE therefore invite closer examination of the arrangements that shape everyday partnership experiences. The soft-power perspective further directs attention to agenda-setting and reciprocity: cooperation's developmental significance depends partly on the extent to which Tanzanian institutions can shape its priorities and sustain its benefits.

Higher education and sustainable development

SDG 4 calls for inclusive and equitable quality education and lifelong learning opportunities (United Nations, 2015). In higher education, this broad commitment can be considered through access, learning quality and relevance, and the institutional capacity to support education over time. These dimensions prevent SDG 4 from being reduced to enrollment, infrastructure, or international mobility alone. They also clarify what must be examined when a study claims that partnerships contribute to the goal.

Higher education can support sustainable development by preparing graduates, producing knowledge, and engaging with societal challenges. The contribution depends on whether curricula and institutional practices equip learners to understand and respond to those challenges. Tilbury (2019) emphasizes the role of higher education in education for sustainable development, reinforcing the need to consider what sustainability means within teaching and institutional practice. From this perspective, partnerships may support SDG 4 when they strengthen relevant learning, research, and institutional capacity. Whether they do so in a particular context remains an empirical question.

For Tanzania, this framework makes it necessary to assess both the opportunities associated with Sino-Tanzanian cooperation and the conditions affecting their distribution and durability. Scholarship provision may expand opportunities for some learners, while questions of selection and participation remain relevant to equity.

Research collaboration may contribute to capacity, while its significance depends on continuity, institutional involvement, and relevance to local needs. Similarly, cross-cultural exchange may support broader learning, but its educational value depends on participants' ability to engage across linguistic and pedagogical differences. These considerations connect SDG 4 to the processes highlighted by internationalization and GCE, while the soft-power lens situates them within bilateral relationships.

Synthesis and research gap

The literature offers a basis for expecting Sino-Tanzanian academic partnerships to contribute to education through mobility, knowledge exchange, and institutional collaboration. It also shows why such contributions should not be assumed: program activities may encounter barriers, and educational benefit depends on implementation, participation, and local relevance. The three theoretical perspectives sharpen this analysis by distinguishing institutional processes, learner-oriented aims, and diplomatic context.

The research problem is the limited clarity, within the literature reviewed, about how these mechanisms relate to inclusive, equitable, and quality higher education in Tanzania. A focused assessment is needed of reported contributions, the conditions shaping educational experiences, and the challenges that affect partnership effectiveness and sustainability. This study addresses that need by examining Sino-Tanzanian partnerships in relation to SDG 4 while treating their effects as questions for investigation rather than predetermined outcomes.

METHODOLOGY

Research Design

This study employed a qualitative case-study design with a comparative approach to examine Sino-Tanzanian higher education partnerships and their relationship to Sustainable Development Goal 4 (SDG 4). The design was selected to facilitate an in-depth examination of the educational contributions, institutional arrangements, implementation challenges and sustainability of academic cooperation between Tanzania and China. Particular attention was given to educational access, academic quality, research collaboration, capacity development, intercultural learning and institutional sustainability.

The study adopted a qualitative-dominant approach, supported by descriptive survey data. Qualitative evidence was obtained through semi-structured interviews, open-ended questionnaire responses and documentary analysis, while structured questionnaire responses provided supplementary quantitative information. This combination enabled the study to examine participants' reported experiences alongside institutional and policy perspectives (Likoko & Wu, 2025). The comparative dimension focused on the experiences of Tanzanian and Chinese stakeholders involved in academic collaboration, allowing the analysis to consider differences in their institutional roles and partnership experiences.

The case-study approach was appropriate because Sino-Tanzanian academic partnerships operate within specific national, institutional and policy contexts. Examining these partnerships through multiple sources of evidence provided an opportunity to explore not only their perceived educational contributions but also the contextual factors that may facilitate or constrain their implementation. The study was guided by the relationship between international academic cooperation and the principal dimensions of SDG 4, particularly inclusive access, equitable participation, quality education and opportunities for lifelong learning (Likoko & Wu, 2025).

Study Context, Participants and Sampling

The study focused on academic partnerships between Tanzania and China, examining the experiences of students, university faculty members, academic volunteers, university administrators and policymakers involved in bilateral higher education cooperation. These stakeholder groups were included to capture different perspectives on the implementation, educational contributions and sustainability of academic partnerships.

The survey involved 250 respondents, comprising 150 Tanzanian students studying in China, 35 Chinese academic volunteers working in Tanzania and 65 faculty members involved in research collaboration or academic exchange programmes. The inclusion of these three groups enabled the study to examine partnership experiences from the perspectives of students, teaching personnel and university academics.

The qualitative component involved 40 interview participants, distributed across four stakeholder groups. These included 10 university administrators (five from Tanzanian universities and five from Chinese universities), eight policymakers (four from Tanzanian institutions and four from Chinese institutions), 12 faculty members (six from each country) and 10 students (five Tanzanian students studying in China and five Chinese students studying in Tanzania). Including participants from both countries provided perspectives on institutional management, policy coordination, academic collaboration and student experiences.

The selection of these participant categories was guided by their relevance to the study's objectives and their involvement in, or experience of, Sino-Tanzanian academic partnerships. The survey and interview components served complementary purposes: the survey documented participants' reported experiences, while the interviews provided more detailed accounts of partnership implementation, institutional practices and perceived educational outcomes.

Data Collection Methods

Three principal data collection methods were employed: structured questionnaires, semi-structured interviews and documentary analysis. The use of these methods enabled the study to examine the research problem from participant, institutional and policy perspectives.

Structured Questionnaire

A structured questionnaire was administered to 250 respondents, comprising Tanzanian students studying in China, Chinese academic volunteers working in Tanzania and Tanzanian faculty members involved in academic collaboration. The questionnaire was designed to collect information about participants' experiences and perceptions of Sino-Tanzanian higher education partnerships, particularly their contributions to educational quality, research collaboration, academic development and SDG 4.

The questionnaire consisted of demographic questions, closed-ended items and open-ended questions. The closed-ended component included five-point Likert-scale statements addressing academic knowledge and skills, research collaboration, SDG 4, educational resources and higher education development. Other questions examined educational quality, inclusivity, access barriers, partnership challenges and opportunities. The open-ended component included two questions inviting respondents to suggest ways of improving academic partnerships and strengthening related policies and institutional practices.

The questionnaire provided descriptive information about participants' perceptions of the educational and professional value of academic cooperation. It also enabled the identification of perceived challenges and opportunities associated with partnership implementation. The open-ended responses provided additional contextual information that complemented the quantitative summaries.

Semi-Structured Interviews

Semi-structured interviews were conducted with 40 participants drawn from university administrators, policymakers, faculty members and students in Tanzania and China. The interviews explored participants' experiences and perspectives on the implementation and perceived effectiveness of Sino-Tanzanian academic partnerships.

The interview questions addressed institutional strategies, policy alignment, research collaboration, student experiences, educational opportunities and the sustainability of academic partnerships. Questions also explored challenges associated with institutional coordination, academic exchange and the implementation of collaborative programmes. The semi-structured format enabled the researcher to address common topics across participant groups while allowing participants to elaborate on issues relevant to their professional responsibilities and personal experiences.

The interviews were conducted face-to-face or through online platforms, including Zoom and Microsoft Teams, and generally lasted between 30 and 60 minutes. Interview recordings were made with participants' consent and subsequently transcribed for analysis. The interviews provided contextual insights into the institutional and individual experiences associated with Sino-Tanzanian higher education cooperation.

Documentary Analysis

Documentary analysis was employed to examine the policy and institutional context of Sino-Tanzanian higher education cooperation. The documentary materials identified in the study included national education policies, bilateral cooperation frameworks, international reports, university agreements, scholarship information and academic partnership reports.

The materials considered included Tanzania's Education Sector Development Plan and National Development Vision 2025, China's Belt and Road education cooperation framework, Forum on China–Africa Cooperation (FOCAC) education frameworks, relevant UNESCO and United Nations reports, university memoranda of understanding, Confucius Institute reports, and scholarship and research collaboration reports.

The documentary analysis focused on three principal areas: policy objectives, institutional and implementation strategies, and the relevance of academic partnerships to higher education development. The documents provided contextual information for interpreting the reported experiences of students, faculty members, administrators and policymakers. They also helped situate the partnership activities within the broader policy and institutional environment of bilateral educational cooperation (Likoko & Wu, 2025).

Data Analysis

The study employed descriptive and inferential statistical techniques alongside thematic analysis to examine the collected data. Quantitative data were analysed using the Statistical Package for the Social Sciences (SPSS), while qualitative information from interviews, open-ended questionnaire responses and documentary materials was examined thematically.

Quantitative Data Analysis

Quantitative questionnaire responses were analysed using descriptive statistics, including frequencies, percentages, means and standard deviations. Frequencies and percentages were used to summarize categorical responses and identify patterns in participants' reported experiences. Means and standard deviations were used to summarize responses to the five-point Likert-scale statements concerning academic development, research collaboration, educational quality and the perceived contribution of partnerships to SDG 4. The study also employed inferential statistical techniques to explore relationships and differences among selected variables. Independent-samples t-tests were reported for comparisons of perceived academic quality between Tanzanian students studying in China and Chinese academic volunteers in Tanzania, and for comparisons of faculty research satisfaction by funding status. Pearson's correlation analysis was used to examine the reported relationship between academic partnership participation and perceived career benefits.

The reported analyses included an independent-samples t-test for perceived academic quality, $t(183) = 2.56$, $p = .012$; a comparison of faculty research satisfaction by funding status, $t(63) = 3.14$, $p = .003$; and a Pearson correlation between academic partnership participation and perceived career benefits, $r = .62$, p less than .001. These analyses were used to explore differences and associations in participants' reported experiences. The statistical findings were interpreted as associations rather than evidence of causal effects.

Qualitative Data Analysis

Qualitative data obtained from semi-structured interviews, open-ended questionnaire responses and documentary materials were analysed thematically. The analysis involved familiarization with the collected

material, identification of recurring concepts, initial coding, grouping related codes into categories and development of overarching themes.

The thematic analysis was organized around three principal themes: the educational impact of Sino-Tanzanian academic partnerships; challenges in policy and implementation; and the sustainability of academic partnerships. These themes provided an analytical structure for examining participants' accounts of educational opportunities, institutional coordination, academic collaboration and the conditions influencing the continuity of partnership activities. The qualitative analysis also considered issues of language and cultural adaptation, access to academic opportunities, curriculum differences, research collaboration and administrative coordination. Interview findings were interpreted in relation to the study's objectives and the broader institutional and policy context. Documentary evidence and open-ended questionnaire responses were considered alongside the interview findings to provide additional context for the interpretation of the themes.

Integration of Data and Ethical Considerations

The study brought together quantitative summaries, qualitative findings and documentary evidence during the interpretation of the results. Survey findings provided an overview of participants' reported experiences, while interviews offered more detailed explanations of perceived benefits and implementation challenges. Documentary materials supplied additional institutional and policy context for interpreting these findings.

The integration of evidence focused on identifying areas of convergence and complementarity across the different sources. For example, survey responses concerning perceived educational and professional benefits were considered alongside interview accounts of academic exchange, research collaboration and institutional support. Similarly, reported challenges relating to language, curriculum and administrative coordination were interpreted in the context of the relevant qualitative and documentary findings. This approach enabled a broader examination of the research objectives without assuming that findings from one source automatically validated those from another.

Ethical considerations were incorporated into the data collection process. Participation in the survey was voluntary, and responses were collected anonymously. Interview participants provided consent for the recording of interviews, and confidentiality was maintained in handling the collected information. These measures were intended to protect participants' privacy and support voluntary participation throughout the research process. Overall, the methodological approach enabled the study to examine Sino-Tanzanian academic partnerships from multiple stakeholder perspectives and across participant, institutional and policy contexts. Combining questionnaire responses, interviews and documentary analysis provided a basis for investigating the reported educational contributions, implementation challenges and sustainability considerations associated with these partnerships in relation to SDG 4.

RESULTS AND DISCUSSION

This section presents the findings on Sino-Tanzanian academic partnerships and their contribution to Sustainable Development Goal 4 (SDG 4). The analysis integrates the reported survey results from 250 participants (150 Tanzanian students studying in China, 35 Chinese academic volunteers in Tanzania, and 65 faculty members), 40 semi-structured interviews, and documentary evidence.

The findings are organized around educational and professional benefits, equity and access, curriculum and pedagogical alignment, and institutional sustainability. Quantitative results are interpreted alongside the qualitative themes, distinguishing participants’ perceptions from independently demonstrated educational outcomes.

Contributions of Sino-Tanzanian partnerships to higher education

The findings indicate that scholarships, academic mobility, faculty exchanges, joint research, and institutional collaboration are important channels through which Sino-Tanzanian partnerships are perceived

to contribute to higher education. Survey responses suggest that participants generally associated these activities with improvements in academic quality and professional opportunities, although the reported perceptions varied between participant groups.

Among Tanzanian students studying in China, 76% reported perceived improvements in academic quality, with a mean satisfaction score of 4.2 on a five-point scale. Among Chinese academic volunteers teaching in Tanzania, 58% reported perceived improvements, with a mean score of 3.8. The reported independent-samples test identified a statistically significant difference between the groups, $t(183) = 2.56$, $p = .012$. These findings indicate that students and academic volunteers evaluated their partnership experiences differently. However, the difference should not be interpreted as evidence that one group received greater educational benefits, since the groups occupied different academic roles and experienced different institutional environments.

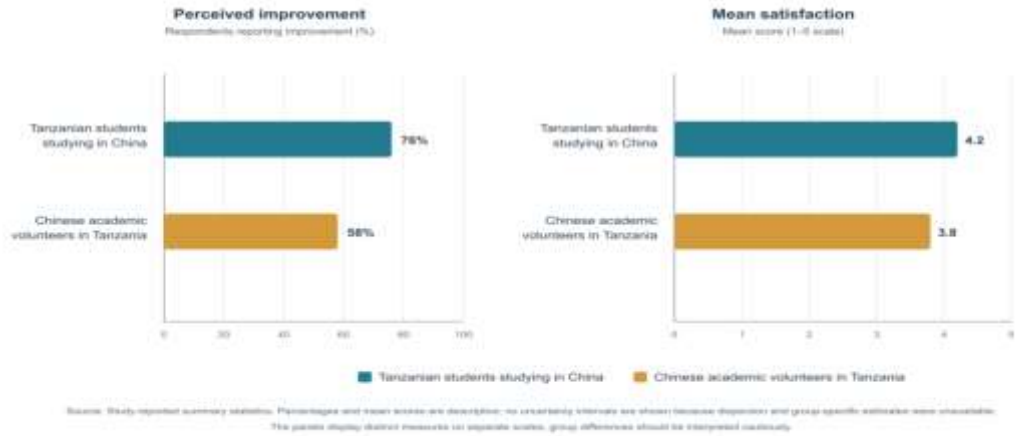


Figure 2: Reported perceptions of academic quality improvement.

The figure compares the proportions of Tanzanian students and Chinese academic volunteers who perceived improvements in academic quality. The difference is descriptive and should be interpreted in the context of the participants' different roles. Career-related responses also indicate perceived benefits. Among Tanzanian students studying in China, 81% reported career benefits, with a mean score of 4.5. Among faculty members involved in research collaboration, 62% reported career benefits, with a mean score of 4.1. These findings suggest that participants associated international academic engagement with professional development, exposure to new knowledge, and expanded academic networks. Nevertheless, the results measure perceived benefits rather than verified employment, promotion, salary increases, or research productivity.

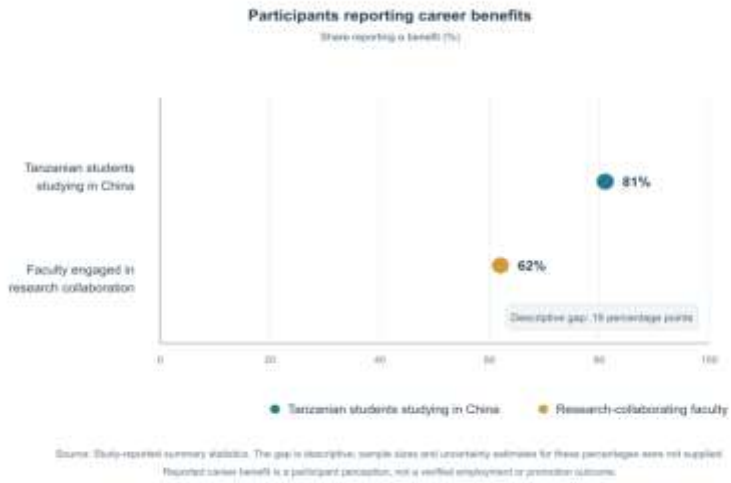


Figure 3: Participants reporting career benefits.

The figure 3 illustrates the reported proportions of students and research-collaborating faculty who perceived professional benefits from partnership participation. The results indicate perceived value rather than objectively measured career outcomes.

The interview findings provide further context for these survey responses. Participants described opportunities to access academic expertise, research facilities, professional networks, and international learning environments.

These experiences offer possible explanations for the positive assessments of academic quality and career development. They also suggest that partnerships can create opportunities for knowledge exchange. However, the extent to which these opportunities translate into sustained institutional improvements depends on how effectively participating universities integrate them into their teaching, research, and organizational activities.

These findings are consistent with the view that internationalization involves more than the movement of students, academics, and resources across national borders. Its educational contribution depends on how international activities are embedded in institutional priorities and academic practices (Knight, 2004; Altbach & de Wit, 2020).

In relation to SDG 4, the findings therefore identify perceived educational opportunities while leaving the magnitude of their longer-term effects undetermined.

Table 1: Reported quantitative indicators of partnership experiences

Indicator	**Participant group**	**Reported result**	**Interpretation**
Perceived academic quality improvement	Tanzanian students in China	76%; M = 4.2	Positive perception of academic quality
Perceived academic quality improvement	Chinese academic volunteers in Tanzania	58%; M = 3.8	Positive perception, with a lower reported proportion
Reported career benefits	Tanzanian students in China	81%; M = 4.5	Perceived professional benefits
Reported career benefits	Research-collaborating faculty	62%; M = 4.1	Perceived professional benefits
Language barriers	Students	42%	Reported communication challenge
Language barriers	Faculty	31%	Reported communication challenge
Adaptation difficulties	Tanzanian students in China	42%	Reported adjustment challenge
Administrative or funding delays	Faculty	27%	Reported implementation challenge

Inclusivity and equity in academic access

Although the findings identify educational and professional opportunities, they also indicate that access to partnership activities may be uneven. The qualitative evidence identifies financial constraints, limited language preparation, and unequal exposure to international academic environments as potential barriers for students from rural and economically disadvantaged backgrounds. These challenges raise questions about whether existing mobility and scholarship opportunities are equally accessible to students with different socioeconomic circumstances.

The reported 42% rate of language barriers among students and the same reported rate of adaptation difficulties among Tanzanian students studying in China highlight the importance of preparation and ongoing academic support. Language difficulties may restrict classroom participation, communication with lecturers, and engagement with academic materials. Adaptation difficulties may also affect students' ability to navigate unfamiliar learning environments.

However, the available findings do not establish a statistical relationship between these challenges and students' academic performance or completion rates.

The interviews also identify communication challenges experienced by Chinese academic volunteers and faculty working in Tanzania. The reported 31% faculty rate for language barriers reinforces the relevance of communication support across both educational settings. These findings suggest that language accessibility is not merely a technical issue but also a condition influencing participation in international academic activities.

From an equity perspective, expanding the number of scholarships or exchanges may not be sufficient if selection procedures and preparatory arrangements disproportionately benefit students who already possess financial, linguistic, or academic advantages.

Inclusive recruitment, preparatory language instruction, accessible academic guidance, and continued support during mobility are therefore relevant considerations for partnership design. Such measures are potential responses to the reported barriers, rather than interventions whose effectiveness has been demonstrated by this study.

Table 2: Qualitative themes and their relationship to reported indicators

Theme in the supplied analysis	Reported experience	Related quantitative indicator	Implication for interpretation
Opportunity and professional development	Participants described access to academic resources, expertise, and networks.	81% of students and 62% of faculty reported career benefits.	Supports perceived value; does not verify employment or institutional impact.
Language and adaptation	Students and faculty described communication and adjustment difficulties.	42% of students reported language barriers; 31% of faculty did so; 42% of students reported adaptation difficulty	Benefits may depend on language preparation and ongoing academic support
Inclusion gaps	The source reports barriers affecting rural and lower-income students	No subgroup counts or disaggregated results supplied	Equity concern is plausible but its prevalence cannot be estimated from the available summaries

Curriculum and pedagogy	Participants reportedly experienced different classroom, assessment, and teaching expectations	No linked quantitative measure supplied	Identifies a potential mechanism affecting participation and perceived quality
Administrative and funding constraints	Faculty accounts identify delays and coordination problems	27% of faculty reportedly experienced administrative or funding delays	Suggests implementation friction; institutional variation is unknown

The findings are also relevant to the inclusive dimension of SDG 4. UNESCO (2015) emphasizes the importance of education that enables learners to participate across cultural and social differences. In this study, the evidence suggests that international exposure alone does not guarantee inclusive participation. Institutional arrangements must also address the conditions that shape who can access and benefit from academic partnerships.

Curriculum and pedagogical alignment

Curriculum and pedagogical alignment emerged as an important qualitative theme. Participants reportedly experienced differences in teaching approaches, assessment practices, course content, and academic expectations across the two educational contexts. Tanzanian students studying in China described learning environments that were, in some cases, more structured and assessment-oriented, while Chinese academic volunteers in Tanzania encountered classroom environments with different expectations concerning discussion and interaction.

These accounts suggest that international academic mobility involves adapting to different pedagogical arrangements as well as accessing new academic resources. Differences in instructional practices may create opportunities for learning, but they may also introduce difficulties when students and teachers are insufficiently prepared for unfamiliar expectations. The implications are particularly relevant where students must adapt to new assessment procedures or where teaching approaches are transferred without adequate consideration of local educational contexts.

The documentary and interview findings also identify academic calendars, credit transfer, and qualification recognition as areas requiring coordination. Unclear credit-recognition procedures may complicate student progression and increase the administrative demands associated with joint programmes. Similarly, differences in institutional requirements may create difficulties for students whose academic progression depends on the successful recognition of coursework completed abroad.

These findings suggest that curriculum collaboration should extend beyond the exchange of teaching materials or the organization of mobility programmes. Joint curriculum planning, clearly defined learning outcomes, transparent assessment procedures, and agreed credit-recognition arrangements may help reduce uncertainty. Faculty development that addresses cross-cultural pedagogy may also help educators respond to differences in students' prior preparation and learning expectations.

The findings support the relevance of institutional internationalization as an integrated academic process rather than a collection of separate mobility activities (Knight, 2004). Nevertheless, the available evidence does not establish whether any particular curriculum or teaching intervention produces better learning outcomes. Evaluation using student progression records, comparable learning assessments, and systematic feedback would be necessary to determine the effectiveness of proposed approaches.

Funding, institutional coordination, and sustainability

Funding and institutional coordination emerged as further conditions affecting partnership implementation. The supplied dataset reports that institutionally funded faculty had a mean research satisfaction score of 4.1

SD=0.78, compared with 3.5 SD=1.02 among non-funded faculty. The reported test was t(63) = 3.14, p = .003. Figure 4 presents the reported means.

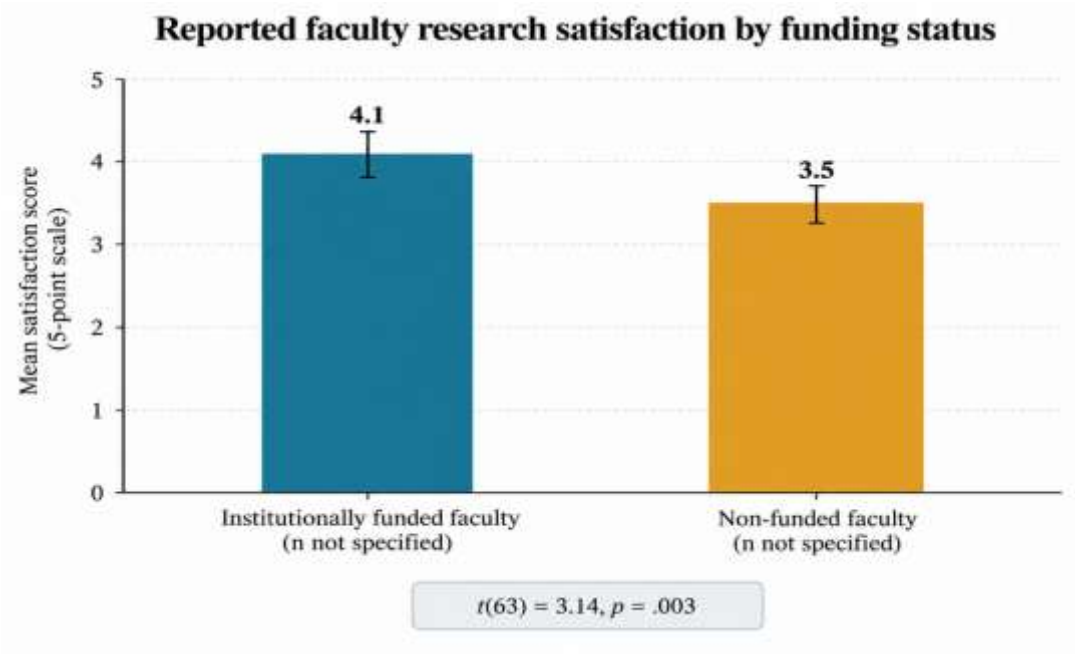


Figure 4: Reported faculty research satisfaction by funding status.

The figure 4 compares the reported mean satisfaction scores of institutionally funded and non-funded faculty. The reported difference is statistically significant according to the supplied test, but the result should be interpreted cautiously because the underlying statistical output and subgroup details were not available for independent verification.

The reported difference suggests an association between funding status and faculty research satisfaction. However, it does not establish that funding status alone explains the difference. Research discipline, academic rank, workload, institutional resources, research experience, and access to facilities may also influence satisfaction. Moreover, the available information does not establish whether the funding groups were comparable on these characteristics. The result should therefore be treated as provisional rather than as evidence of a causal funding effect.

The qualitative findings identify funding continuity and administrative coordination as additional concerns. Twenty-seven per cent of faculty reportedly experienced administrative or funding delays. Because these categories were combined in the supplied indicator, the percentage cannot distinguish financial delays from other administrative difficulties. The qualitative accounts also identify accreditation, qualification recognition, visa processing, academic calendars, and institutional mandates as areas where coordination may be challenging.

These findings highlight the importance of institutional arrangements in determining whether partnership activities can be maintained. Clear administrative responsibilities, timely communication, and transparent financial procedures may help reduce implementation difficulties. Local institutional participation in planning and resource allocation may also support continuity beyond individual exchange activities. However, the study does not provide longitudinal evidence demonstrating that particular funding or coordination arrangements lead to more sustainable partnerships.

Infrastructure development, including internet access, laboratories, smart classrooms, and digital learning resources, is identified in the source material as a potential area of institutional benefit. Such resources are relevant to educational quality when they improve access to teaching, learning, and research. Nevertheless, the available dataset does not provide baseline and follow-up infrastructure measures, and it cannot establish the extent of infrastructure improvements attributable to Sino-Tanzanian cooperation.

Integrated findings and implications for SDG 4

The combined findings reveal three interconnected dimensions of Sino-Tanzanian academic partnerships: perceived educational and professional opportunities, barriers to equitable participation, and institutional conditions affecting implementation and continuity. Survey responses indicate perceived benefits in academic quality and career development, while the qualitative evidence identifies language difficulties, adaptation challenges, curriculum differences, funding constraints, and administrative delays.

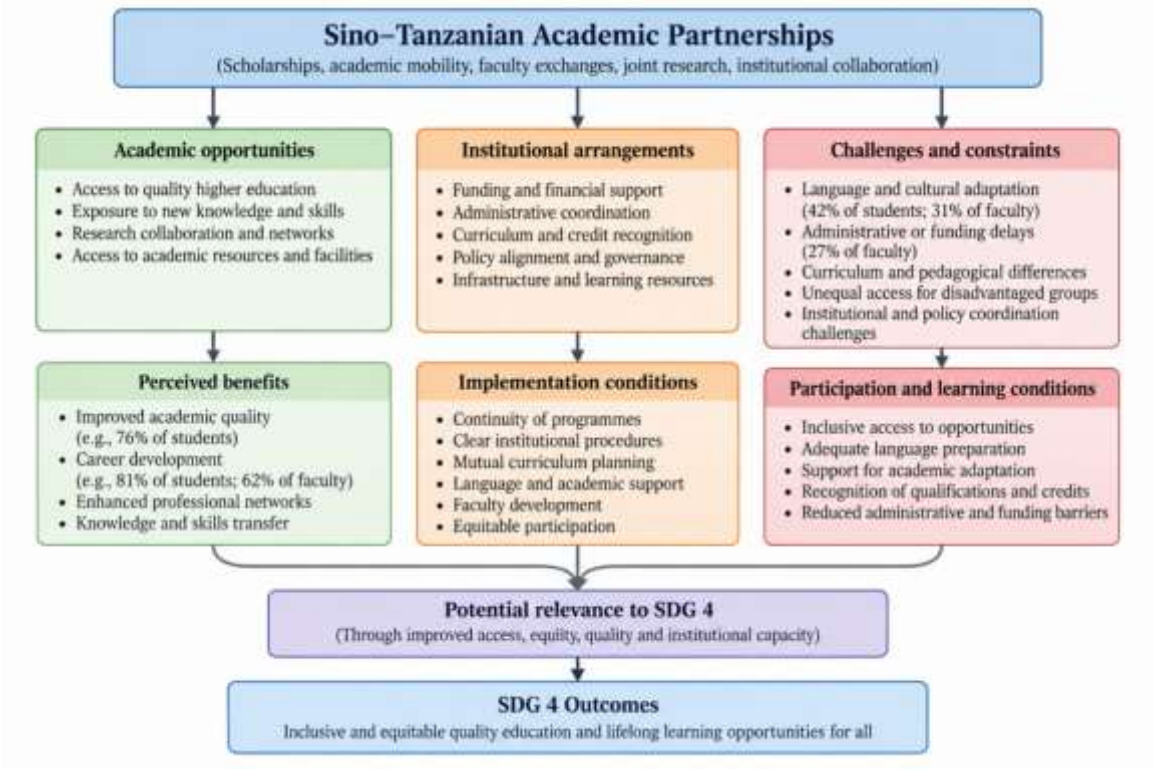


Figure 5: Analytical pathway linking partnership activities with SDG 4 relevance.

The figure 5 summarizes the relationships suggested by the findings. Partnership activities may create academic opportunities, while institutional arrangements shape implementation and continuity. Language, equity, and adaptation challenges may influence participation. The diagram represents an interpretive framework, not a statistically tested causal model.

The findings indicate that the educational significance of international partnerships cannot be assessed solely through the number of scholarships, exchanges, or collaborative activities. Their relevance to SDG 4 also depends on equitable access, the quality of academic engagement, and the institutional capacity to sustain activities. In this respect, the findings suggest that partnership effectiveness is shaped by the interaction between opportunities and implementation conditions.

The evidence also indicates that different participants may experience partnerships differently. Students emphasized perceived academic and career benefits, while faculty accounts highlighted research support and implementation challenges. These perspectives are complementary but should not be assumed to represent the experiences of all students, academics, or institutions in Tanzania and China.

The results consequently support several practical considerations: inclusive scholarship selection, language preparation, academic adaptation support, reciprocal curriculum planning, transparent credit recognition, and improved administrative coordination. These measures address challenges identified in the study, although their effectiveness requires further evaluation. Partnerships may also benefit from monitoring student access, progression, learning outcomes, research outputs, and institutional resource continuity rather than relying exclusively on participant satisfaction.

DISCUSSION AND EVIDENTIAL LIMITATIONS

Overall, the findings portray Sino-Tanzanian academic partnerships as sources of perceived educational and professional opportunity whose contribution depends on the conditions under which they are implemented. The results are consistent with internationalization scholarship that emphasizes the integration of international activities into institutional practice (Knight, 2004; Altbach & de Wit, 2020). They also reinforce the relevance of examining equity and educational quality together: opportunities for international engagement may coexist with barriers that limit participation.

The study contributes to the discussion of SDG 4 by connecting partnership experiences with questions of access, teaching, research support, and institutional sustainability. However, the evidence primarily concerns participant perceptions and reported experiences. It does not demonstrate national-level improvements in educational quality, long-term employment effects, measurable learning gains, or causal changes in institutional performance.

Several limitations should therefore inform interpretation. The reported statistics require confirmation against the underlying dataset and complete statistical output. Some indicators lack clearly documented denominators and item wording, while the available summaries do not provide subgroup characteristics or confidence intervals for all comparisons. The qualitative findings identify relevant themes, but the supplied material does not provide sufficient coding information to establish their prevalence across all participants. These limitations restrict the strength and generalizability of the conclusions.

Future evaluations should use clearly documented recruitment procedures, validated measures, disaggregated participation data, and longitudinal indicators of academic progression and research activity. They should also examine how funding, language support, curriculum coordination, and institutional governance relate to measurable outcomes. Such evidence would make it possible to assess more precisely the contribution of academic partnerships to inclusive, equitable, and sustainable higher education.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined reported experiences of Sino-Tanzanian higher education partnerships in relation to Sustainable Development Goal 4 (SDG 4), focusing on educational opportunities, academic quality, inclusion and institutional sustainability. Drawing on a qualitative case study supported by survey summaries, semi-structured interviews, open-ended responses and documentary analysis, the study explored the perceived contributions of bilateral academic collaboration and the challenges affecting its implementation. However, inconsistencies in the reported survey sample sizes and the absence of respondent-level data necessitate caution when interpreting the findings.

The reported survey results indicate that participants perceived benefits from Sino-Tanzanian academic partnerships in academic quality, research opportunities and career development. Specifically, 76% of Tanzanian students studying in China and 58% of Chinese academic volunteers in Tanzania reported improvements in academic quality. Similarly, 81% of students and 62% of faculty reported career-related benefits. The reported mean agreement scores, ranging from 4.1 to 4.5, also suggest generally positive perceptions of academic skills development, research collaboration, educational resources and the partnerships' relevance to SDG 4. Nevertheless, these findings reflect participants' perceptions rather than independently verified improvements in learning outcomes, employment, research productivity or institutional performance.

The qualitative findings further highlight the educational opportunities associated with scholarships, academic exchanges, collaborative research and access to academic resources. However, these opportunities coexist with language barriers, cultural and academic adjustment difficulties, curriculum differences and administrative constraints. Financial uncertainty, unequal participation and limited local ownership also emerge as important considerations for the long-term sustainability of bilateral cooperation. These findings

indicate that the educational value of international partnerships depends not only on the opportunities they provide but also on how effectively participating institutions address the practical and structural challenges of implementation.

The reported statistical findings provide additional indications of relationships between partnership experiences and perceived educational and professional outcomes. However, the reported differences in faculty research satisfaction by funding status and the positive correlation between partnership participation and perceived career benefits should be interpreted as exploratory associations. The available information does not permit independent verification of these results or establish that partnership participation or funding arrangements directly produce the reported outcomes.

Overall, the study suggests that Sino-Tanzanian academic partnerships have the potential to contribute to educational opportunities and institutional collaboration relevant to SDG 4. Their contribution to inclusive, equitable and sustainable higher education, however, cannot be established solely through reported perceptions or short-term partnership activities. It also depends on equitable access, effective institutional coordination, sustainable financing, reciprocal academic engagement and the continuity of collaborative initiatives. Given the limitations of the available evidence, the findings should be understood as an account of reported experiences and implementation challenges rather than proof of causal effects or nationwide educational impact.

Consequently, future assessments should prioritize transparent sampling procedures, consistent participant records, validated measurement instruments, comprehensive statistical reporting and longitudinal evaluation. Such improvements would provide a stronger empirical basis for determining how Sino-Tanzanian academic partnerships contribute to educational quality, equity and institutional sustainability and for identifying the conditions under which their potential contribution to SDG 4 can be sustained.

Recommendations

Based on the reported findings, the study proposes six recommendations for strengthening the implementation, inclusivity and sustainability of Sino-Tanzanian higher education partnerships.

Strengthen language preparation and academic support.

Partner universities should establish structured language preparation and continuous academic support for students, visiting academics and exchange participants. Preparatory programmes should address academic communication, disciplinary vocabulary, intercultural interaction and the academic expectations of host institutions. Bilingual learning resources and accessible language assistance could help participants navigate linguistic and educational differences. Universities should regularly assess the effectiveness of these initiatives through participant feedback, academic engagement and progression indicators rather than assuming that the provision of language training automatically resolves communication barriers.

Promote joint curriculum development and academic recognition.

Tanzanian and Chinese partner institutions should strengthen collaborative curriculum development through bilateral academic working groups. These groups should address learning outcomes, course content, assessment standards, academic calendars, credit transfer and qualification recognition.

Joint curriculum planning, modular course design and collaborative teaching could help institutions identify differences in educational expectations and improve programme coherence. Such arrangements should maintain appropriate academic standards while accommodating the educational priorities of both countries. Their effectiveness should be assessed through indicators such as credit recognition, student progression and participants' experiences of curriculum alignment.

Improve equitable access to academic opportunities.

Universities and scholarship providers should establish transparent selection procedures and communicate

scholarship, mobility and exchange opportunities through accessible channels. Particular attention should be given to financial constraints, geographical disparities, language preparation and other barriers that may restrict participation. Where feasible, preparatory programmes and targeted academic support should be provided to students with limited prior access to international educational opportunities. Institutions should also monitor participation and educational outcomes across relevant student groups, subject to appropriate privacy and ethical safeguards, to identify inequalities and inform subsequent programme adjustments.

Strengthen reciprocal research and teaching capacity.

Sino-Tanzanian partnerships should move beyond short-term academic exchanges towards sustained collaboration in teaching, research and professional development. Partner institutions should jointly establish research priorities, facilitate faculty mentoring, support collaborative teaching and encourage participation by early-career academics. Research activities should reflect mutually agreed priorities and provide opportunities for both Tanzanian and Chinese researchers to contribute to research design, implementation and dissemination. Institutions should document collaborative outputs, professional development activities and the continued application of acquired skills to assess whether exchange programmes generate lasting academic and institutional benefits.

Enhance financial sustainability and institutional continuity.

Universities and relevant government institutions should develop realistic financing strategies that support the continuity of collaborative programmes beyond individual projects or external funding cycles. Where feasible, these strategies could combine external partnership funding with domestic institutional allocations and other locally appropriate financial sources. Financial plans should clearly specify institutional responsibilities for programme continuation, resource maintenance and financial accountability. Funding arrangements should also preserve academic independence and promote transparent decision-making. Given the financial constraints facing higher education systems in Africa, sustainability strategies should reflect the actual financial and administrative capacities of participating institutions (Teferra, 2021).

Establish a collaborative monitoring and evaluation framework.

Partner institutions should develop a shared monitoring and evaluation framework to assess the implementation and outcomes of Sino-Tanzanian academic partnerships. The framework should include clearly defined indicators covering access, participation, academic progression, learning experiences, research collaboration and institutional continuity. Baseline data should be established before changes are assessed, and quantitative indicators should be complemented by interviews, open-ended responses and documentary evidence. Where feasible, longitudinal follow-up of graduates could provide information about further study and employment, while institutional monitoring could establish whether collaborative activities continue beyond individual projects. Evaluation reports should document sampling procedures, measurement methods, missing data and analytical limitations to improve transparency and the credibility of conclusions about contributions to SDG 4.

Taken together, these recommendations emphasize the importance of connecting academic opportunities with institutional capacity, equitable participation and long-term programme continuity. Their implementation would provide a practical basis for improving bilateral cooperation while generating more reliable evidence about its contribution to inclusive, equitable and quality higher education.

Ethics Approval and Consent to Participate

This study adhered to ethical standards for research involving human participants. All participants provided informed consent prior to data collection. Anonymity and confidentiality were strictly maintained throughout the study. The research protocol was reviewed and approved by the institutional ethics committee of Tanzania National Health Research Ethics Committee (NatHREC), Ethical Review Board to ensure that the research adhered to the highest ethical standards, in compliance with the Declaration of Helsinki and standard guidelines for linguistic research involving learner data.

Consent for Publication

All authors have reviewed and approved the final manuscript for submission. Any participant consent for publication of identifiable information, quotations, or images should be reported only if such material is included and the relevant consent was obtained.

Competing Interests

The authors declare no competing interests related to this research. There are no financial, professional, or personal conflicts that could have influenced the study's design, data collection, analysis, or interpretation.

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Authors' Contributions

First Author contributed to conceptualizing the study, conducted data collection, led the manuscript drafting, contributed to data analysis, literature review, and manuscript revisions. Second Author provided critical insights into the research framework and data analysis, The third Author supervised the study and approve the final revision. All authors participated in discussions, reviewed the final draft, and approved the manuscript for submission.

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